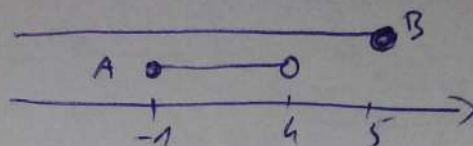


grupa X

ZBIORY 1F

1. $A = [-1, 4)$, $B = (-\infty, 5]$



• $A \cup B = (-\infty, 5]$

• $A \cap B = [-1, 4)$

• $A \setminus B = \emptyset$

• $B \setminus A = (-\infty, -1) \cup [4, 5]$

• $A' = (-\infty, -1) \cup [4, +\infty)$

• $B' = (5, +\infty)$

• $A' \cap B = (-\infty, -1) \cup [4, 5]$

• $A \cup B' = [-1, 4) \cup (5, +\infty)$

2. x - cena 1 kg broszkwi (niektamynek) na porzątku

po podwyżce: $1,04x$ - cena 1 kg br.

$1,08x$ - cena 1 kg nekak

$2 \cdot 1,04x + 2 \cdot 1,08x = 2 \cdot 2,12x = 4,24x$ - cena końcowa

$4x$ - cena porzątkowa

$$\frac{4,24x - 4x}{4x} = \frac{0,24x}{4x} = 0,06 \cdot 100\% = 6\%$$

Odp: Koszyk zakupów zdrożeje o 6%.

3. • $4(2x+1) - (3+x) = 2(x-2)$

$8x + 4 - 3 - x = 2x - 4$

$5x = -5$

$x = -1$

• $\frac{3x-1}{4} - \frac{x+1}{8} \geq \frac{5x+1}{6} - 3 \quad | \cdot 24$

$6(3x-1) - 3(x+1) \geq 4(5x+1) - 72$

$18x - 6 - 3x - 3 \geq 20x + 4 - 72$

$-5x \geq -59 \quad | \cdot (-1)$

$5x \leq 59$

$x \leq \frac{59}{5}$

$x \in (-\infty, \frac{59}{5}]$

TAK, malarz.

$$4. \quad O_1(69) = x / 100$$

$$- 69(69) = 100x$$

$$\hline 69 = 89x / : 89$$

$$x = \frac{69}{89}$$

$$O_1(74) = y / 100$$

$$- 74(74) = 100y$$

$$\hline 74 = 89y$$

$$y = \frac{74}{89}$$

$$x + y = \frac{69}{89} + \frac{74}{89} = \frac{143}{89} = \underline{\underline{1.6}}_9$$

$$\begin{array}{r} 1.44 \dots \\ 143 : 89 \\ - 89 \\ \hline 440 \\ - 386 \\ \hline 440 \end{array}$$

$$5. \quad \frac{(x^2 - 81)(x - 3)}{x + 9} = 0 \quad | \cdot (x + 9)$$

$$(x^2 - 81)(x - 3) = 0$$

$$x^2 - 81 = 0 \quad \vee \quad x - 3 = 0$$

$$x^2 = 81 / \sqrt{\quad} \quad \vee \quad x = 3$$

$$|x| = 9$$

$$x = 9 \quad \vee \quad x = -9$$

⊕

$$\underline{x \in \{3, 9\}}$$

$$\text{Zerf: } x + 9 \neq 0$$

$$x \neq -9$$

$$\underline{D = \mathbb{R} \setminus \{-9\}}$$

$$6. \quad A = \{1, 2, 4, 6, 7, 8\} \quad B = \{2, 3, 5, 6, 7, 9\}$$

$$a) \quad A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$\underline{A} \quad \{1, 2, 4, 6, 7, 8\} \subset C$$

$$\{2, 3, 5, 6, 7, 9\} \subset C$$

$$C \subset \{1, 2, 3, 4, 5, 6, 7, 8, 9\}$$

$$\left. \begin{array}{l} \{1, 2, 4, 6, 7, 8\} \subset C \\ \{2, 3, 5, 6, 7, 9\} \subset C \\ C \subset \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \end{array} \right\} \text{stad } \underline{C = A \cup B}$$

$$b) \quad C \cap B = \emptyset$$

$$C \cup B = A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9\} \quad \left. \begin{array}{l} \\ \end{array} \right\} \text{stad } 1, 4, 8 \in C$$

$$B = \{2, 3, 5, 6, 7, 9\}$$

$$\text{over } 2, 3, 5, 6, 7, 9 \notin C$$

(bo wtedy $C \cap B$ nie byty pusty)

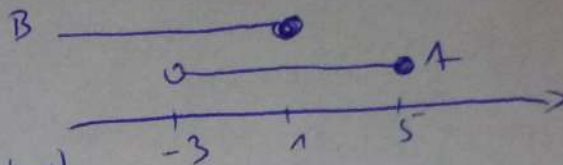
$$\text{Zatem } C = \{1, 4, 8\}$$

$$7. \quad A = \{a, b, \{b\}\}$$

$$P(A) = \{\{a\}, \{b\}, \{\{b\}\}, \emptyset, \{a, b\}, \{a, \{b\}\}, \{b, \{b\}\}, \{a, b, \{b\}\}\}$$

grupa Y.

1. $A = [-3, 5]$, $B = (-\infty, 1]$



- $A \cup B = (-\infty, 5]$
- $A \cap B = [-3, 1]$
- $A \setminus B = (1, 5]$
- $B \setminus A = (-\infty, -3]$
- $A' = (-\infty, -3] \cup (5, +\infty)$
- $B' = (1, +\infty)$
- $A' \cap B = (-\infty, -3]$
- $A \cup B' = (-3, +\infty)$

2. To samo co w grupie X

3. $A = \{a, b, \{a, b\}\}$

$$\mathcal{P}(A) = \left\{ \{a\}, \{b\}, \{\{a, b\}\}, \{a, b\}, \{a, \{a, b\}\}, \{b, \{a, b\}\}, \{a, b, \{a, b\}\}, \emptyset \right\}$$

4. $2(x-4) = 2(3+4x) - (2x-2)$ • $\frac{2x+1}{4} - \frac{x-2}{8} \leq \frac{3x+2}{6} - 2 \quad | \cdot 24$

$$2x - 8 = 6 + 8x - 2x + 2$$

$$-4x = 16 \quad | : (-4)$$

$$\underline{x = -4}$$

$$6(2x+1) - 3(x-2) \leq 4(3x+2) - 48$$

$$12x + 6 - 3x + 6 \leq 12x + 8 - 48$$

$$-3x \leq -52 \quad | : (-3)$$

$$x \geq \frac{52}{3} = 17\frac{1}{3}$$

$$\underline{x \in [17\frac{1}{3}, +\infty)}$$

Nie ma rozwiązań.

5. $\frac{(x^2-16)(x-3)}{x+4} = 0 \quad | \cdot (x+4)$

$$(x^2-16)(x-3) = 0$$

$$x^2 - 16 = 0 \vee x - 3 = 0$$

$$x^2 = 16 \quad | \sqrt{}$$

$$x = 3$$

$$|x| = 4$$

$$x = 4 \vee x = -4$$

4)

$$\underline{x \in \{3, 4\}}$$

zauw: $x+4 \neq 0$

$$x \neq -4$$

$$\underline{D = \mathbb{R} \setminus \{-4\}}$$

$$6. \quad 1(31) - 0,85(85)$$

$$\begin{aligned} 1(31) &= x \cdot 100 \\ - 131(31) &= 100x \\ \hline 130 &= 99x \cdot 100 \\ x &= \frac{130}{99} \end{aligned}$$

$$\begin{aligned} Q(85) &= y \cdot 100 \\ - 85(85) &= 100y \\ \hline 85 &= 99y / :99 \\ y &= \frac{85}{99} \end{aligned}$$

$$x - y = \frac{130}{99} - \frac{85}{99} = \frac{45}{99} = \frac{5}{11} = \underline{0,45}$$

$$\begin{array}{r} 0,454 \\ 5:11 \\ 50 \\ -44 \\ \hline 60 \\ -55 \\ \hline 50 \\ -44 \\ \hline 6 \end{array}$$

7. To samo w w grupie X zad. 6.